

CLAIMS

1. A curable liquid acryloyl group containing resin composition obtained by reacting

- 5 (a) at least one monofunctional vinyl compound, and
(b) at least one multifunctional acrylic ester, with
(c) at least one β -dicarbonyl group containing compound or resin, in which the β -dicarbonyl group has two activated hydrogen atoms in its methylene position,

-10 wherein the equivalent ratio of the vinyl group of the monofunctional vinyl compound (a) to the activated hydrogen atom of the compound or resin (c) is in the range from 0.01:1 to 0.9:1 and

the equivalent ratio of all unsaturated groups from both
15 monofunctional vinyl compound (a) and multifunctional acrylic ester (b) to the activated hydrogen atom of the compound or resin(c) is $>1.05:1$.

2. The composition according to claim 1, characterized in
20 that component (a) is selected from the group consisting of acrylic esters (acrylates), alkyl vinyl ketones, acroleine, acrylonitrile, acrylamide or vinylsulfonate.

3. The composition according to claims 1 to 2 characterized
25 in that component (c) is selected from the group consisting of acetoacetates, β -diketones or malonates.

4. The composition of claim 1, characterized in that the monofunctional vinyl compound has at least one additional functional group having atoms other than carbon and hydrogen.

5 5. The composition according to claim 4, characterized in that the monofunctional vinyl compound having at least one additional functional group is 2-hydroxyethyl acrylate, 2-hydroxypropyl acrylate, 2-hydroxybutyl acrylate, 3-hydroxybutyl acrylate, 4-hydroxybutyl acrylate, 6-hydroxyhexyl acrylate, N-alkoxymethyl acrylamide, N-acryloyl morpholine, glycidyl acrylate, 2-isocyanatoethyl acrylate, poly(ethylene glycol) monoacrylate, poly(propylene glycol) monoacrylate, perfluoroalkyl acrylate or poly(dimethylsiloxane) monoacrylate.

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6. A process for the preparation of the curable liquid acryloyl group containing resin composition as claimed in claim 1, comprising the step of reacting

(a) at least one monofunctional vinyl compound, and

20 (b) at least one multifunctional acrylic ester with

(c) at least one β -dicarbonyl group containing compound or resin, in which the β -dicarbonyl group has two activated hydrogen atoms in its methylene position,

such that the equivalent ratio of the vinyl group of the monofunctional vinyl compound (a) to the activated hydrogen atom of the compound or resin (c) is in the range from 0.01:1 to 0.9:1 and

the equivalent ratio of all unsaturated groups from both the monofunctional vinyl compound (a) and the multifunctional acrylic ester (b) to the activated hydrogen atom of the compound or resin (c) is $>1.05:1$.

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7. A process for the preparation of the curable liquid acryloyl group containing resin composition as claimed in claim 1, comprising the steps of

(1) reacting

-10 (a) at least one monofunctional vinyl compound, with

(c) at least one β -dicarbonyl group containing compound or resin, in which the β -dicarbonyl group has two activated hydrogen atoms in its methylene position,

to yield a mono-substituted β -dicarbonyl group containing
15 compound or resin, in which the mono-substituted β -dicarbonyl group has only one activated hydrogen atom in its methylene position,

and

(2) reacting said mono-substituted β -dicarbonyl group
20 containing compound or resin with

(b) multifunctional acrylic ester.

8. The process according to claim 7, wherein the equivalent ratio of the vinyl group of the monofunctional vinyl compound
25 (a) to the activated hydrogen atom of the compound or resin (c) is in the range from $0.01:1$ to $0.9:1$ in the step (1), and the equivalent ratio of vinyl group of the multifunctional

acrylic ester (b) to the activated hydrogen atom of the mono-substituted β -dicarbonyl group containing compound or resin is >1.05:1 in the step (2).

5 9. A process according to claim 6 or 7, wherein the monofunctional vinyl compound (b) has at least one additional functional group other than vinyl group.

10. The process according to claim 6 or 7, wherein the
-10 process is carried out in the presence of a catalyst which is selected from the group consisting of organic and inorganic basic compounds, having a $pK > 11$ or from the group consisting of ammonium halogenides or from the group consisting of
tertiary organic phosphines.

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11. A curing method, comprising the step of curing a curable liquid acryloyl group containing resin composition according to claim 1 to 5 by ultraviolet light or electron beam or heat.

20 12. The curing method according to claim 11, wherein the curing step is carried out in the absence of a photoinitiator.

13. A cured product obtained by the curing method according to claim 11 or 12.

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